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"I get my zero for angles of position with the divided eye-piece from a mean of several stars. This agrees very nearly with the zero from γ *Virginis*. An observation with the divided eye-glass is the mean of two readings, either in position or distance, taken in contrary separation of the images. The weights are estimations depending on the perception of the observer, the fineness of the night, the consciousness of being successful or not," &c.

Extract of a Letter from Prof. Weisse to Col. Sabine, relating to the Continuation of the Reduction of the Observations of the Stars in Bessel's Zones.

"On astronomy I cannot say much; the sky has been throughout the past winter very unfavourable for observations; weeks were frequently passed without a star being seen. You are aware that I have determined to work up the remaining zones of Bessel from +15° to +45°. This is a very laborious work, which requires much time and an enormous amount of patience, all the more that I am confined to my own personal labour, even for the minutest details. I have been urged to the work from many quarters. I thought seriously for some time whether I should or should not undertake a labour which will require for many years the whole of the time which is left to me from my other avocations. The diligent use which has been made by astronomers of the first part of my catalogue has induced me to take the matter in hand. In order that the work may come the sooner into the hands of astronomers, it will be divided into four parts, each of which will contain six hours of right ascension. Some days since I entered the last stars of the first six hours in the catalogue. The precessions, taken out of my own special tables, are still to be added for the fourth and fifth hours, and the first volume will then be finished. If my life should be spared, and especially sufficient rest of mind for so serious a work, I hope to be able to bring it to a termination. I may, in addition, remark, that this time the shape and printing will be altogether different from those of the first catalogue."

Brief Description of a small Equatoreal and Dome at Tarn Bank, near Cockermouth. By Isaac Fletcher, F.R.A.S.

"Towards the close of the year 1847, I purchased from Thomas Cooke, of Coney Street, York, a 6-foot achromatic refractor, having a clear aperture of 4·14 inches, and mounted on a portable equatoreal stand constructed somewhat in the German style. A little experience in the use of this instrument convinced me of its excellent quality, and consequently I determined to erect an observatory to place it in, in order to give it full efficiency. The mounting being deemed not sufficiently stable and firm for a fixed instrument, an entirely new one with clock-work motion was ordered, and whilst these were in progress the observatory was erected.

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"Owing to local obstruction, it was necessary that the floor of the observatory should be raised a considerable height above the surface of the ground. Accordingly, an octagonal stone tower, 18 feet in height and 14 feet diameter outside, was erected, on the walls of which a massive coping-stone was placed. On this coping-stone a circular building of brick is erected, 6½ feet in height, the walls of which are 9 inches thick. The internal diameter of this building (which constitutes the *observatory*) is 11 feet 3 inches, and the entrance into it is by means of a door in the floor, to which a staircase in the octagonal part of the building leads. The floor is 12 inches above the commencement of the circular brickwork, and is of wood. Across the centre of the floor, and in the direction of the astronomical meridian, are laid two massive beams of American pine timber, 12 inches square. These beams are placed close together *below* the boarding of the floor, of which they are entirely independent, not being in contact in any part whatever. On each end of the beams is raised a heavy piece of brickwork and Roman cement. The south pier is capped by a large block of sandstone, weighing about 5 cwt. This stone supports a small casting, in which is placed a small block of lignum vitæ, in which the lower pivot of the polar axis turns. On the north pier a stone column is placed, which bears on its summit a framing of cast-iron, to which the adjustments are attached for supporting the upper pivot of the polar axis. On the top of the circular wall a ring of wood is firmly fixed, to which is screwed the cast-iron channel in which the 3 four-inch balls rest, on which the dome revolves. Both the upper and lower rings are cast in one *entire* piece, and are beautiful specimens of loam casting.

"The dome is a perfect hemisphere, and is formed of a number of vertical ribs of the requisite curvature, 4½ inches broad and 1½ inch thick, which radiate from a large block of wood at the vertex of the dome. This framework is covered by 1½-inch pine boarding, covered with canvass, and painted and sanded in the manner described by the Rev. W. R. Dawes, F.R.A.S., in his description of the Camden Lodge Observatory. (See *Mem. Roy. Astron. Soc.*, vol. xvi. p. 323.) The shutters of the roof-opening are of sheet-iron, bent to the curvature of the dome; they are two in number, and, when open, lay back against the dome.

"The telescope is mounted on a long polar axis, similar in principle to those adopted by Dollond in most of his equatoreals. The tube is placed on *one side* of the polar axis, to the opposite side of which a leaden counterpoise is screwed. The polar axis is of mahogany, and is 9 feet long, 7 inches square at each end, and 9 inches square at the middle. The hour and declination circles are each 20 inches in diameter; they are divided on silver, and read by verniers, the former to 2^s of time, and the latter to 10″ of space.

"The driving clock is a very elegant piece of workmanship, and performs its work with singular smoothness and regularity. The regulation is effected by means of a *governor*, precisely similar to

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those used in steam-engines, the extra power being absorbed by a brass friction-wheel.

"There are seven negative eye-pieces attached to the telescope, the powers of which vary from 45 to 350, and two single lenses of 400 and 500 respectively.

"The positive eye-pieces of the micrometer are six in number, the powers of which vary from 50 to 420.

"The position-circle of the micrometer is divided on silver, and reads by two opposite verniers to single minutes of space. The heads of the screw are each divided into 100 parts, and by careful estimation each division may be subdivided into 5ths or 10ths.

"As evidence of the quality of the object-glass, it may be added that I can readily see the two companions of τ *Orionis*, one of which is rated by Captain Smyth as of the 15th mag., Herschel's '*debilissima*' couple between ε and 5 *Lyræ*. I have also frequently seen, and under rare atmospheric circumstances, have caught up, the 5*th star* in the great nebula of *Orion*. The star 36 *Andromedæ*, the separation of which Sir J. Herschel adduces as a proof of the excellence of his celebrated 7-foot achromatic of 5 *inches aperture*, I have seen with power 400 completely severed.

"Both the building and the mounting of the instrument are remarkably firm and steady.

"The whole of the workmanship of this equatoreal, both optical and mechanical, is by Mr. Cooke, upon whom it reflects great credit.

"It is proposed to devote this instrument to an examination of a selected list of double stars, taken from Smyth's admirable '*Cycle*.'"

Note by Mr. Dawes, to his late Paper, "On the Phenomena attending the Disappearance of Saturn's Ring."

"In my paper lately presented to the Society, 'On the Phenomena attending the Disappearance of *Saturn's* Ring,' I have stated that the brightest points visible on the obscure surface of the ring, namely, the eastern and western extremities, receive reflected light from *one-half only* of the illuminated surface of *Saturn*, which would be seen from them as a *half moon*.

"Soon after that paper was sent, it occurred to me that, as the plane of the ring coincides with the planet's equator, the parts of the ring in question would receive reflected light from *one quarter only* of *Saturn's* illuminated hemisphere, which would be seen from them as *the northern or the southern half of a half moon*. The *base* of this illuminated quadrant would appear *in the horizon;* and the angle subtended by it in *azimuth*, as seen from the exterior portion of the inner ring, would be about 27½ degrees; while, in consequence of the oblateness of *Saturn's* form, the *altitude* of the quadrant will be only about 25 degrees.